

REMARKS

In response to the office action dated March 15, 2011, the applicant has currently amended claim 1. Claims 10 and 11 are newly added. Claims 2, 3, 8, and 9 are original. Claim 7 is previously presented. Claims 4-6 are previously canceled, without prejudice. Claim 1 is independent.

35 U.S.C. § 102 rejections

Claims 1-3 and 7-9 were rejected under 35 U.S.C. § 102(b) as being anticipated by Fenn et al., WO1998/004147 (“Fenn”), as evidenced by Chao et al., “Structure-function relationship in the globular type III antifreeze protein: Identification of a cluster of surface residues required for binding to ice”, Protein Science, Vol. 3, 10, pages 1760-1769 (1994) (“Chao”).

Independent claim 1, as amended, recites “deriving an antifreeze protein from fish without heat treatment.” Neither Fenn nor Chao, whether taken alone, or in any proper combination, describes such features. Although Fenn mentions “fish AFPs” in the background discussion, Fenn does not describe deriving an antifreeze protein from fish, let alone deriving the antifreeze protein without heat treatment. Instead, Fenn isolates anti-freeze peptides from plants including winter-rye and grass by boiling or heating to 85 °C to 100 °C (page 11, lines 4-5 and 16-17, and page 12, lines 4-4 and 12-14).

On the other hand, although Chao recognizes that fish can have antifreeze proteins (page 1760, last paragraph in the right column), Chao does not describe deriving an antifreeze protein from fish. Instead, Chao produces antifreeze proteins from *E. coli* and refers to a reference “Use of proline mutants to help solve the NMR solution structure of type III antifreeze protein” by Chao et al., (“Chao 1993,” a copy of which is submitted herewith). Chao 1993 describes that an insoluble AFP is extracted as inclusion bodies from *E. coli* sonicate pellet (page 1426, left column, lines 1-2). Although Chao 1993 analyzes antifreeze protein from ocean pout, Chao 1993 does not describe deriving the protein from the ocean pout and is silent regarding “deriving an antifreeze protein from fish without heat treatment.” For production of the antifreeze protein from ocean pout, Chao 1993 refers to a reference “Structure of an antifreeze polypeptide and its

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precursor from the ocean pout, *Macrozoarces americanus*", by Li et al, J. Biol. Chem. 260, 12902-12909 (page 1426 of Chao 1993, second paragraph in the left column).

In conclusion, neither Fenn nor Chao, whether taken alone, or in any proper combination, describes, nor would have made obvious, the features of applicant's claim 1 as now amended. Dependent claims 2, 3, and 7-11 are patentable for at least reasons similar to those discussed with respect to claim 1.

The fee in the amount of \$1110.00 is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 19758-0002US1.

Respectfully submitted,

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